

# KIC 008953414

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008953414-01	OBS	4332.01	2.665967	131.583046	155.0	5.366	12.7	14.0	0.77	4965	1.19	278.06

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008953414-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_OFFSET—EPHEM_MATCH

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008953414-01

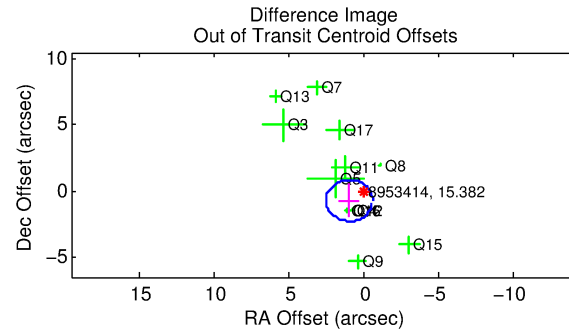
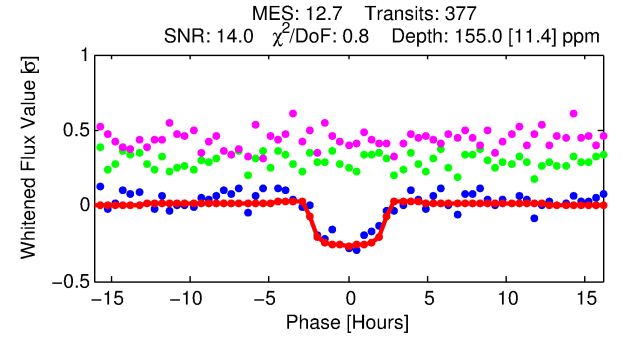
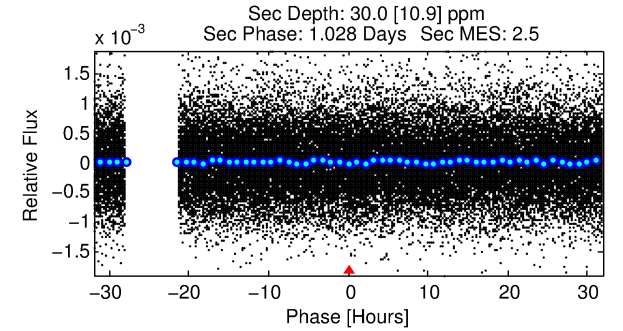
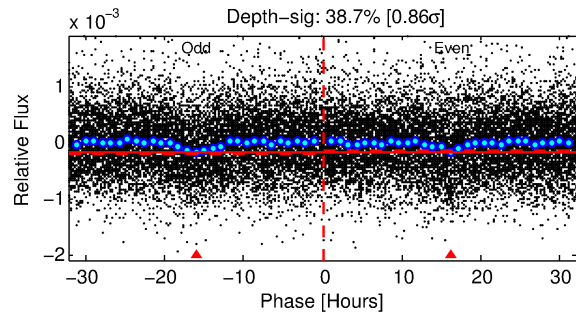
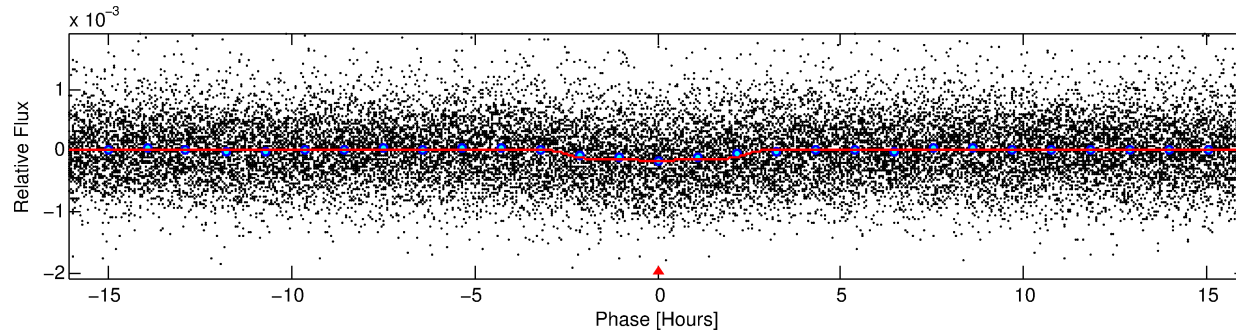
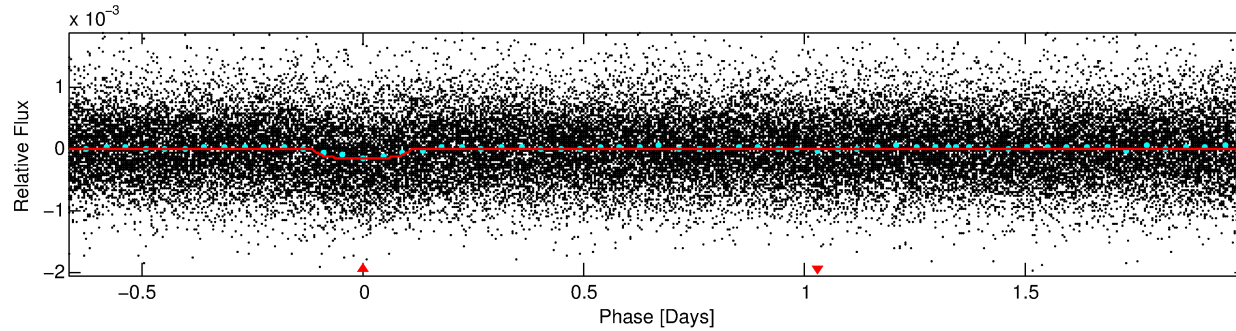
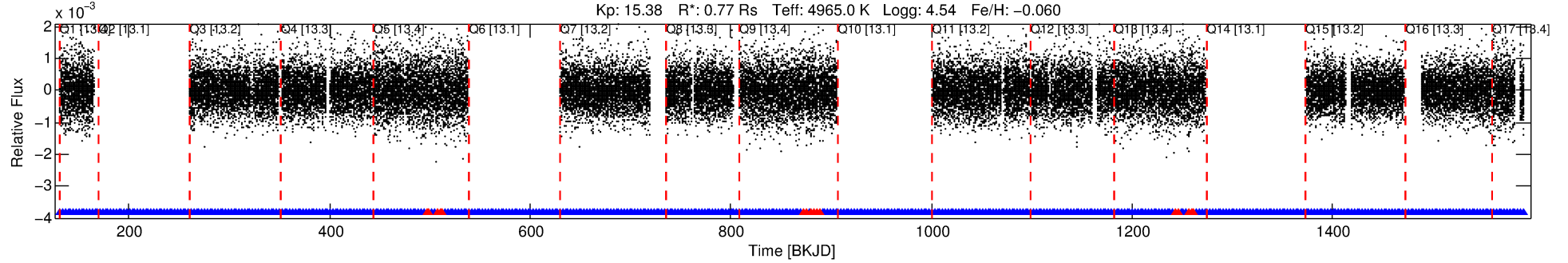
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
008953414-01	8953414	7113.01	8953426	1:1	82.8	13	16	12.16	15.39	1067.50	Direct-PRF	0	2.19	1.83

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 8953414 Candidate: 1 of 1 Period: 2.666 d  
KOI: K04332.01 Corr: 0.940

Kp: 15.38 R\*: 0.77 Rs Teff: 4965.0 K Logg: 4.54 Fe/H: -0.060



## DV Fit Results:

Period = 2.66597 [0.00002] d  
Epoch = 131.5830 [0.0047] BKJD  
Rp/R\* = 0.0141 [0.0034]  
a/R\* = 1.94 [1.39]  
b = 0.91 [0.19]  
Seff = 278.06 [54.99]  
Teq = 1041 [51] K  
Rp = 1.18 [0.31] Re  
a = 0.0341 [0.0031] AU  
Ag = 13.69 [8.42] [1.51σ]  
Teff = 3096 [477] K [4.28σ]

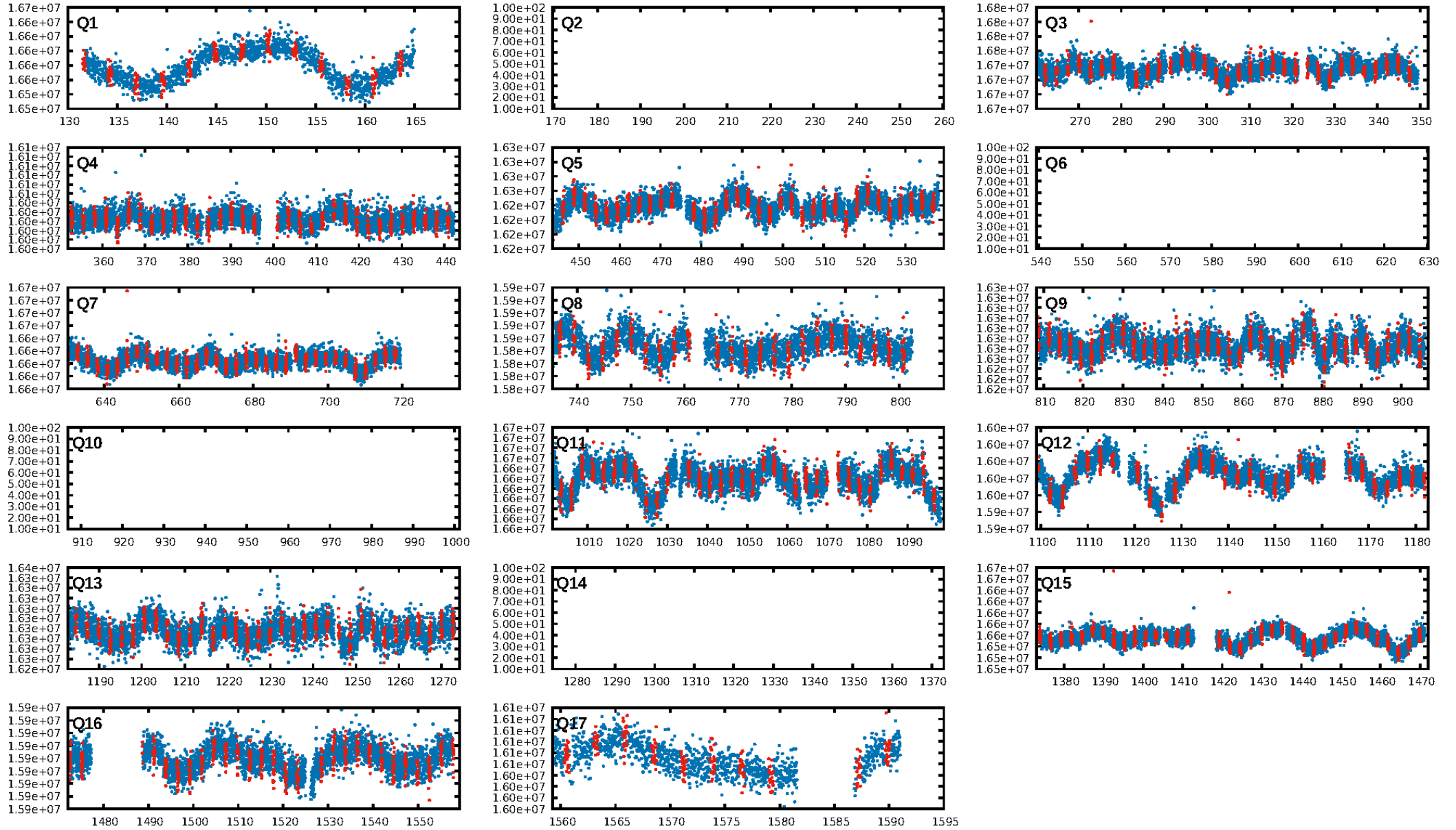
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.59e-35  
RollingBand-fgm: 0.95 [338/354]  
GhostDiagnostic-chr: -0.3119  
Centroid-sig: 0.0%  
Centroid-so: 4.453 arcsec [4.46σ]  
OotOffset-rm: 1.168 arcsec [2.25σ]  
KicOffset-rm: 1.367 arcsec [1.79σ]  
OotOffset-st: 0/4/4/4 [12]  
KicOffset-st: 0/4/4/4 [12]  
DiffImageQuality-fgm: 0.00 [0/12]  
DiffImageOverlap-fno: 1.00 [13/13]

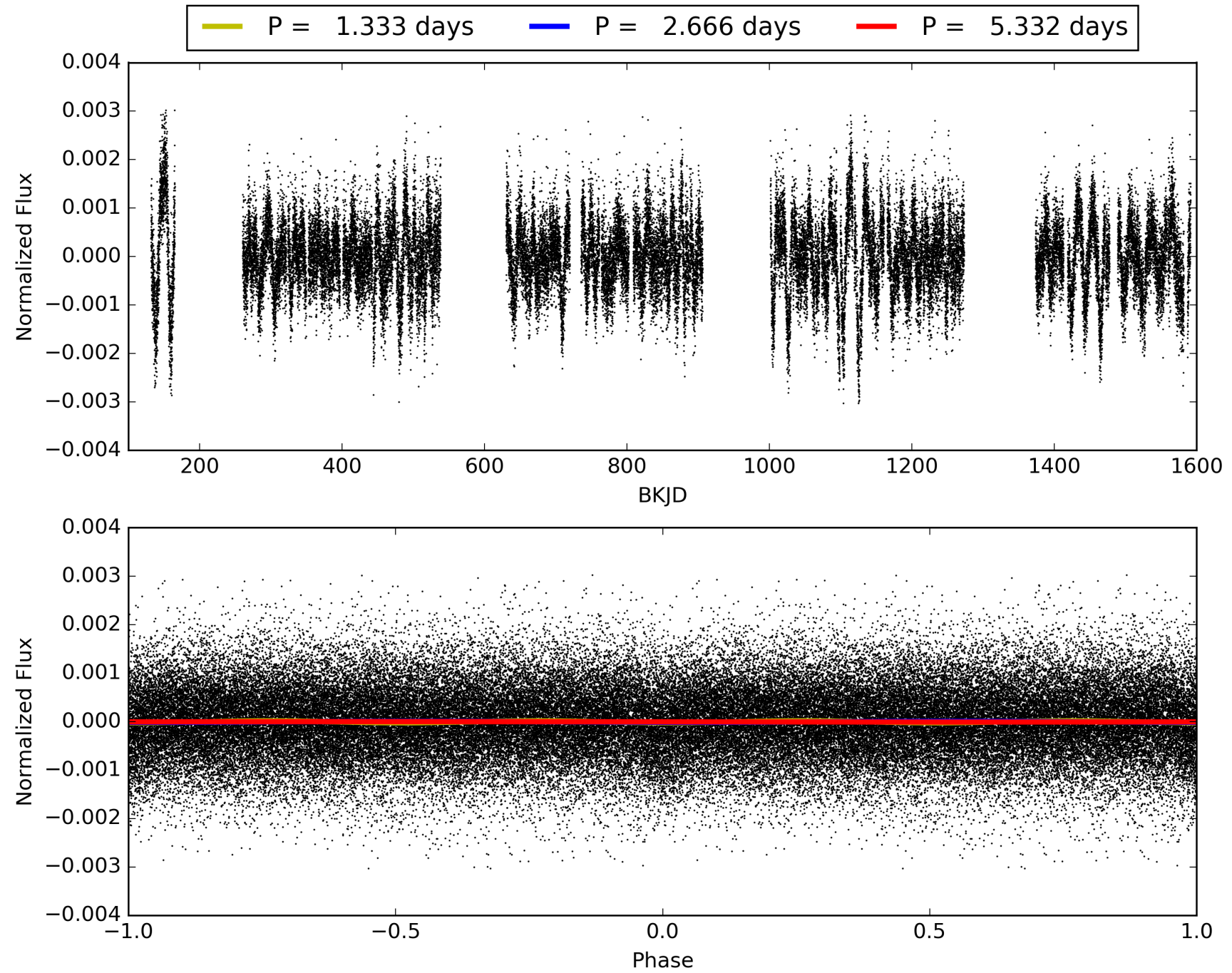
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:47:00 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008953414-01, PDC Light Curves

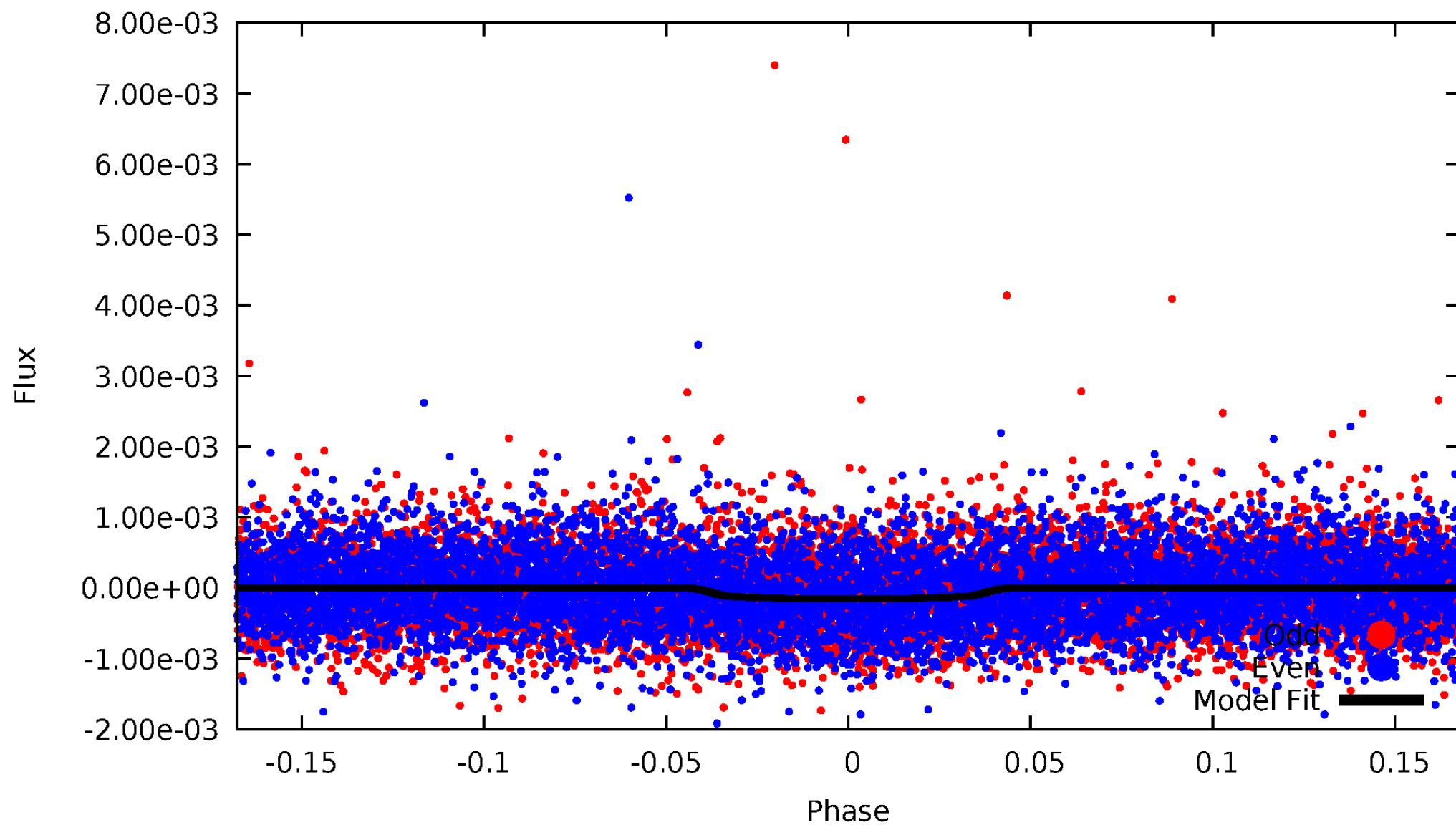


TCE 008953414-01



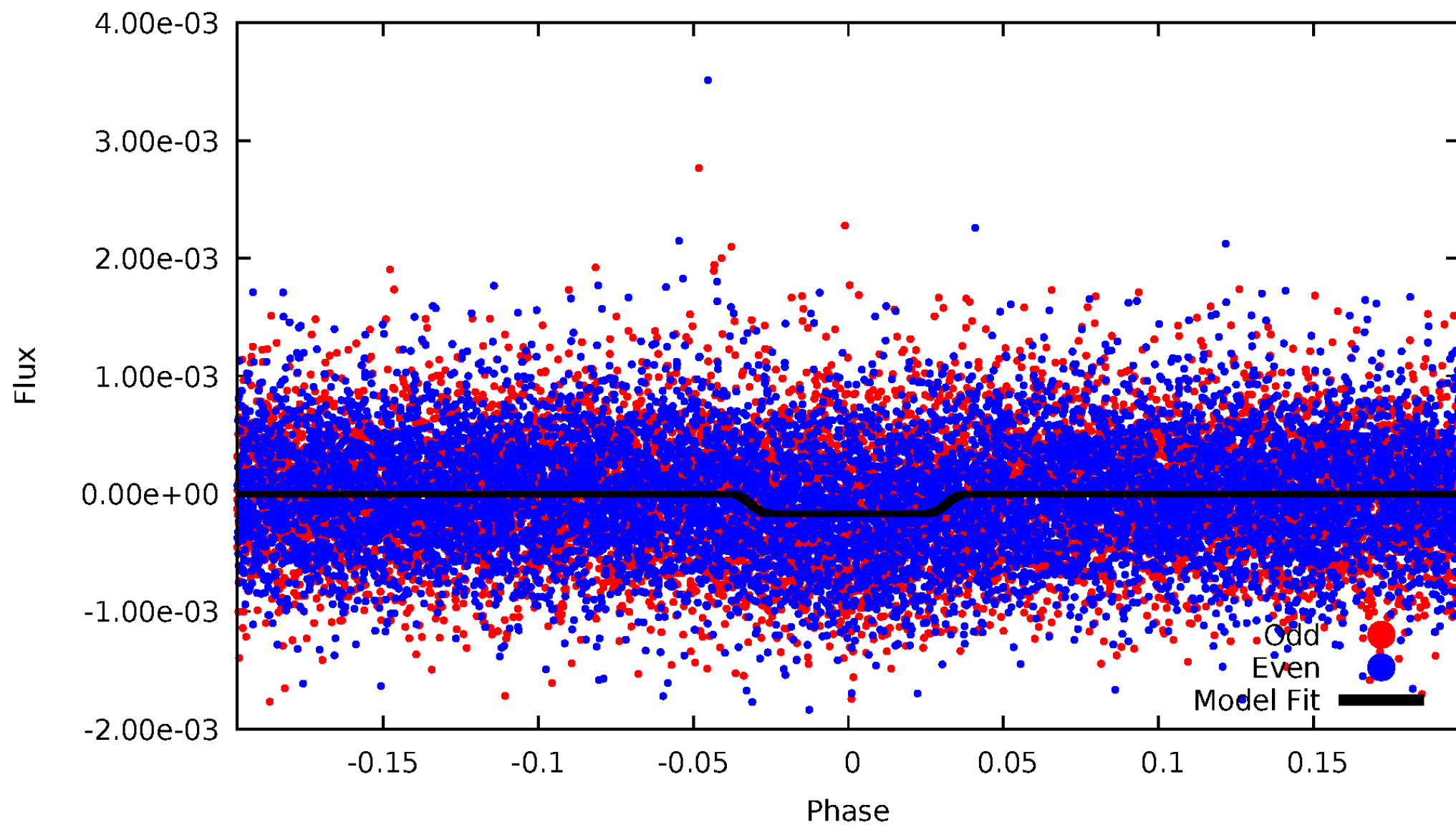
# DV Odd/Even

TCE 008953414-01



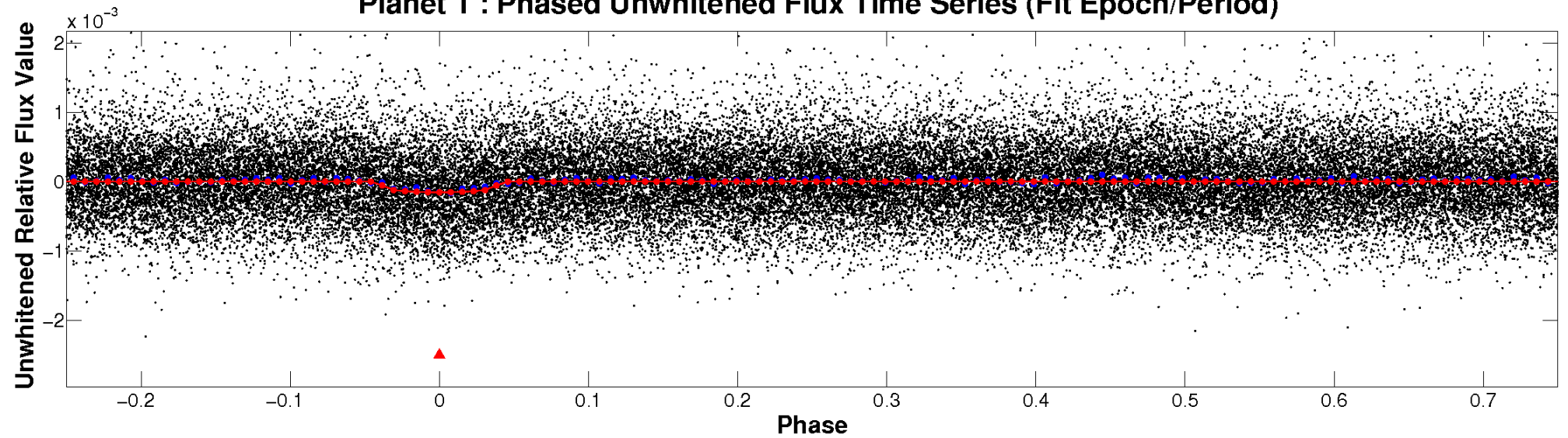
# ALT Odd/Even

TCE 008953414-01

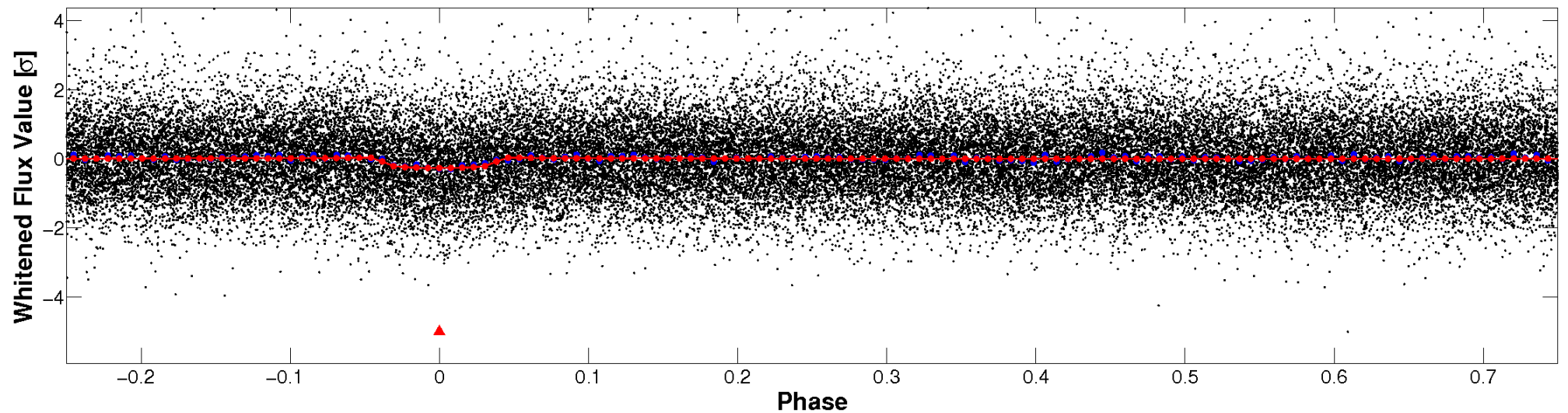


# Non-Whitened Vs. Whitened Light Curve

**Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)**

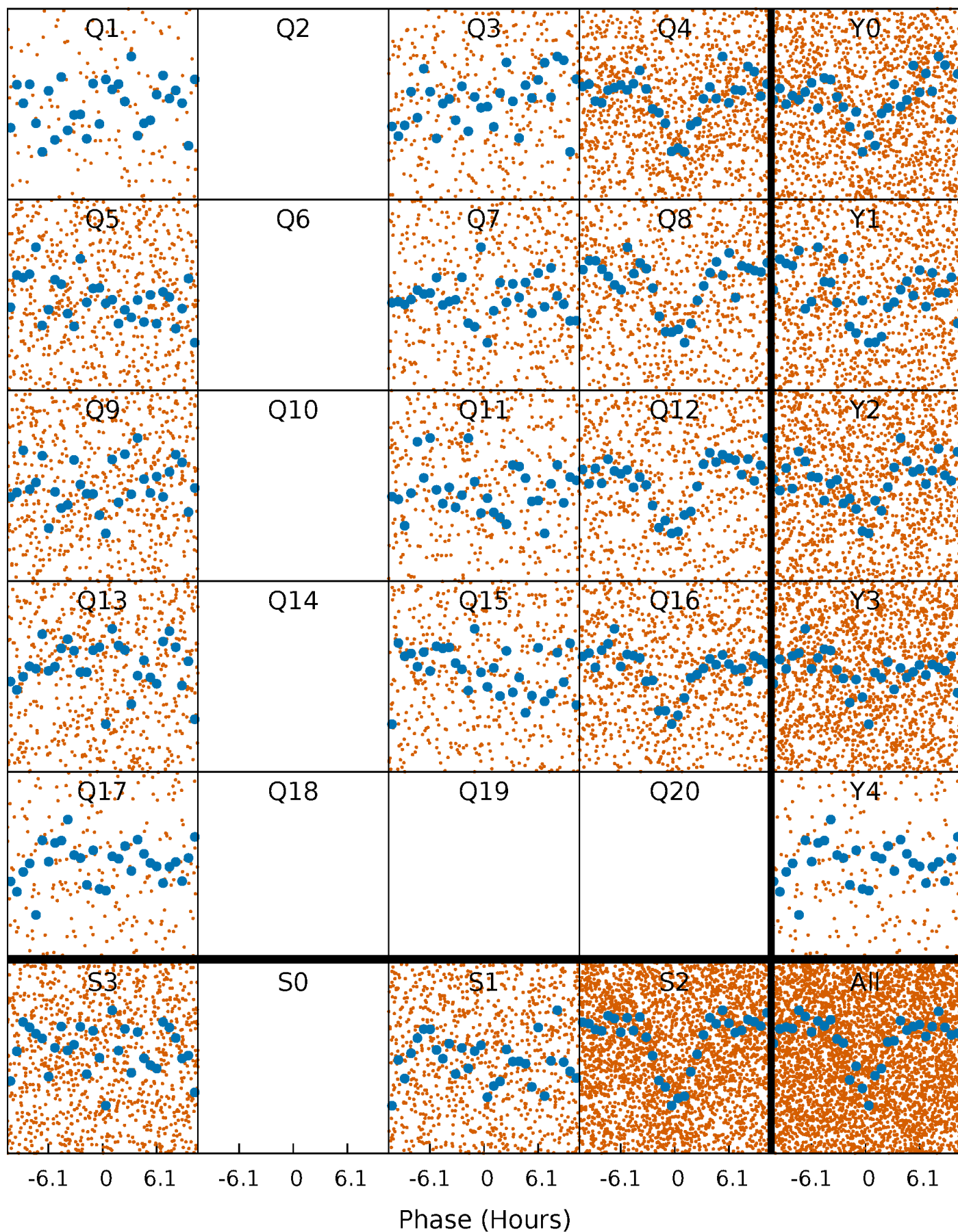


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



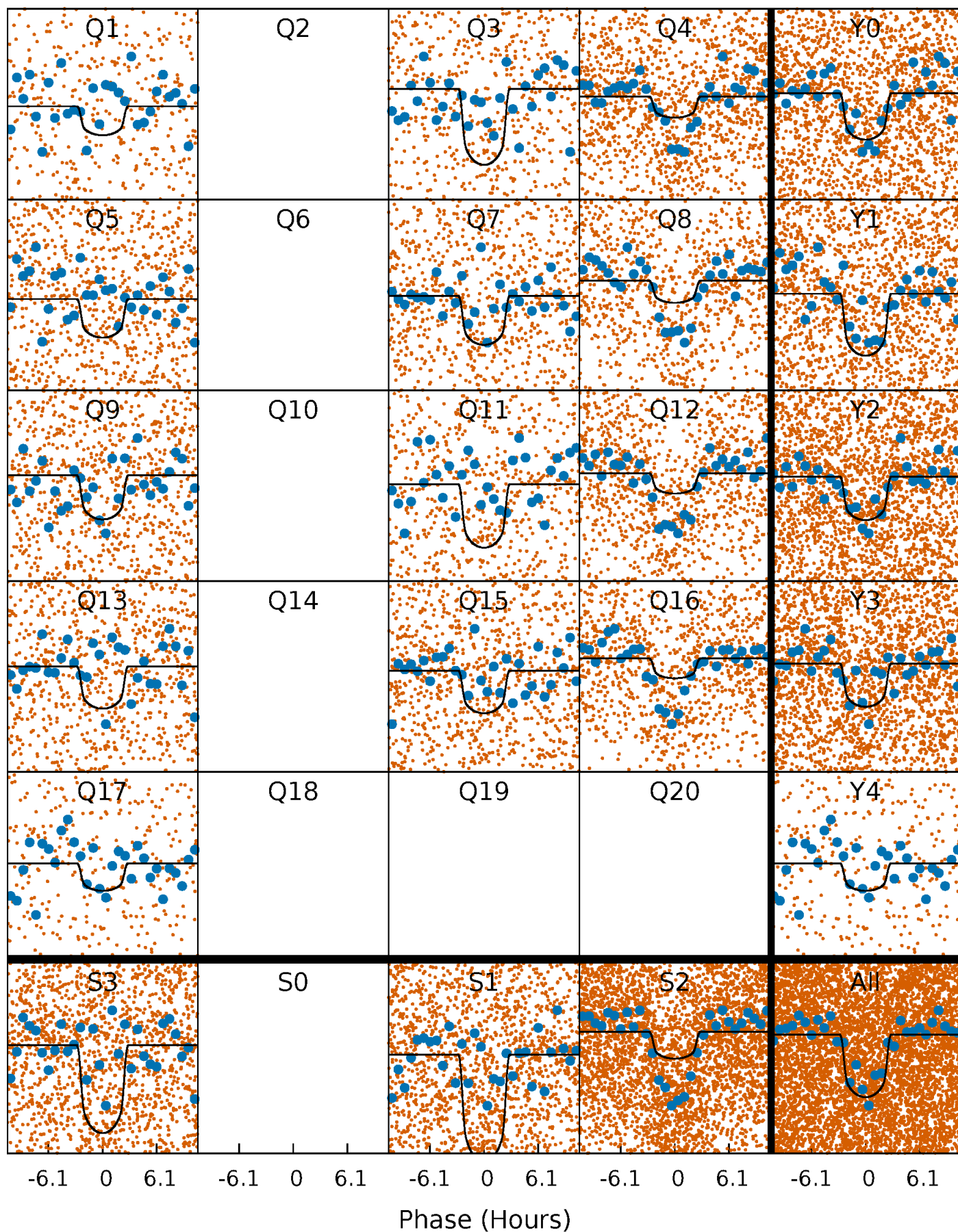
# PDC Quarter-Phased Transit Curves

TCE 008953414-01 P= 2.665967 Days  $T_0=131.583046$  (BKJD)



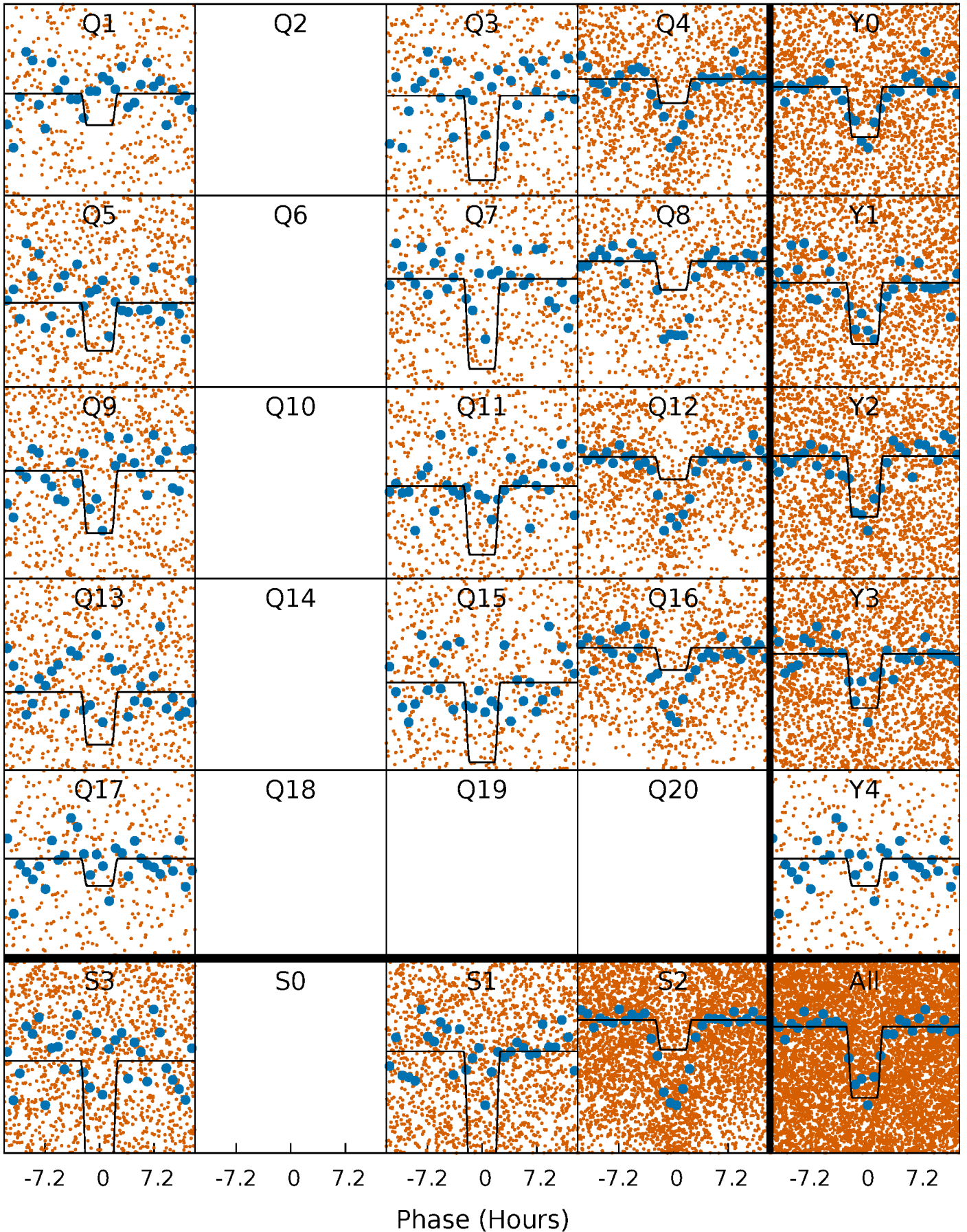
# DV Quarter-Phased Transit Curves

TCE 008953414-01   P= 2.665967 Days    $T_0=131.583046$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

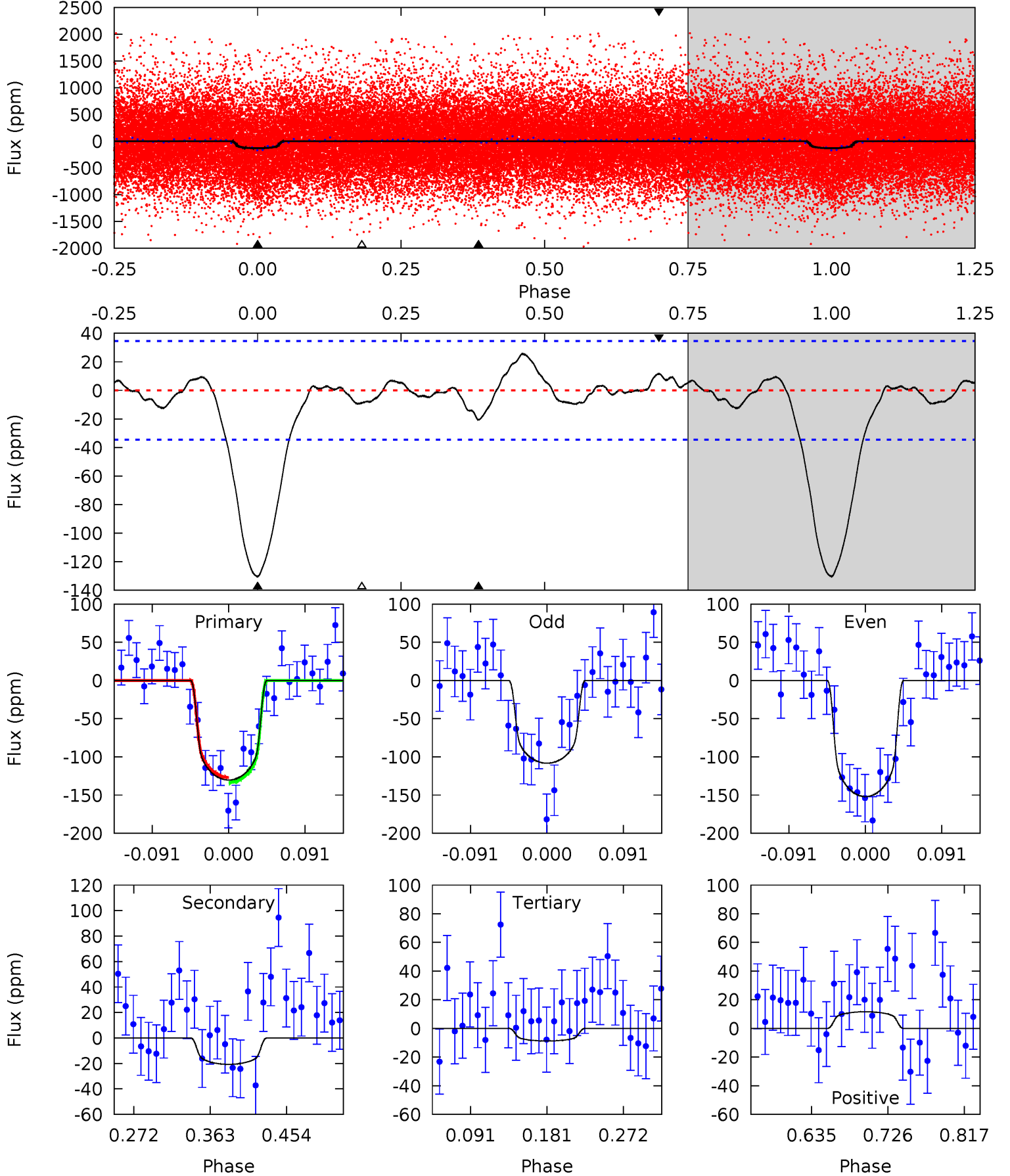
TCE 008953414-01 P= 2.665883 Days  $T_0=131.605434$  (BKJD)



# DV Model-Shift Uniqueness Test

008953414-01, P = 2.665967 Days, E = 128.917079 Days

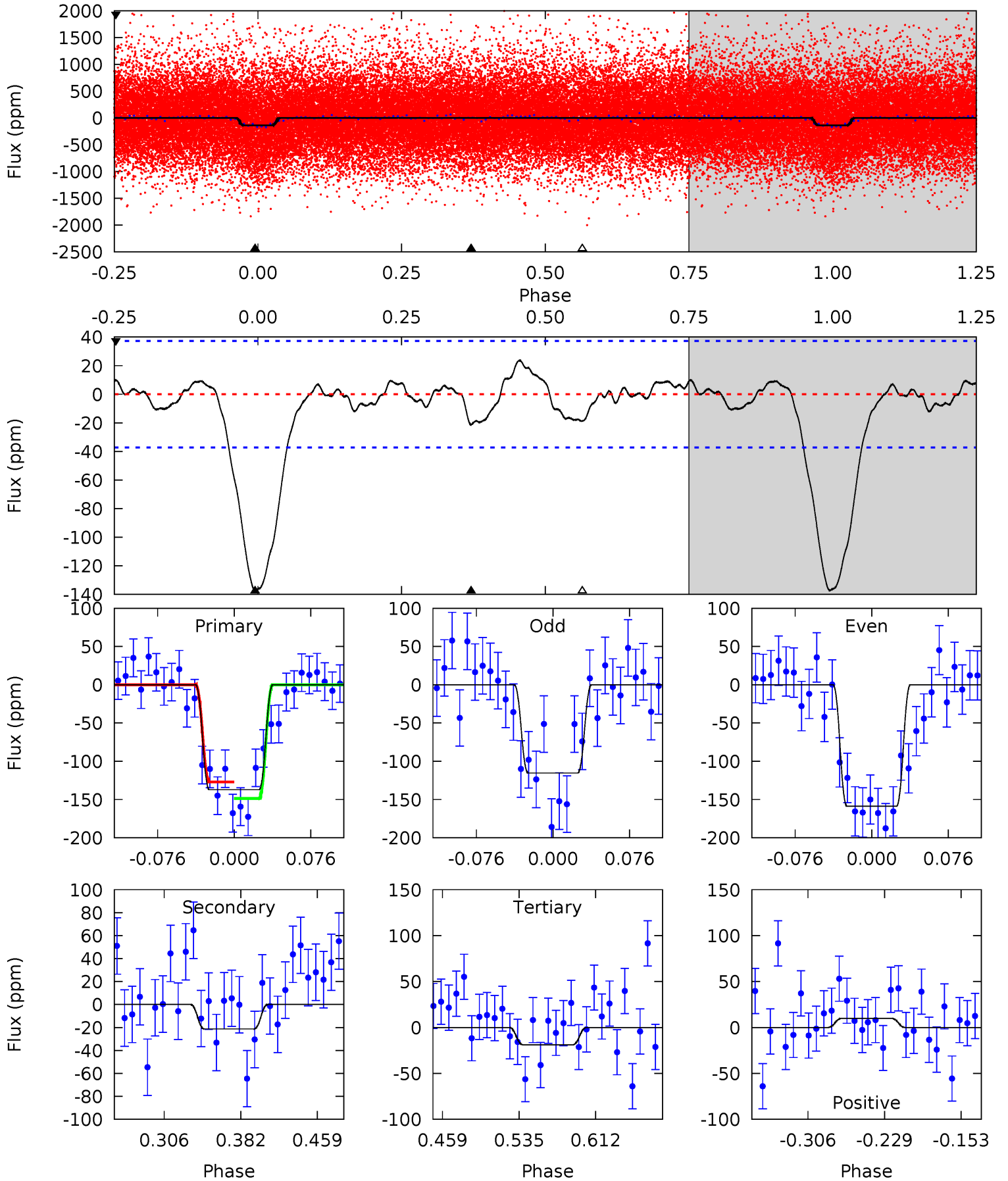
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.3	2.75	1.17	1.54	4.59	1.69	0.84	16.1	15.8	1.58	1.20	2.92	1.14	0.16	0.43



# Alt Model-Shift Uniqueness Test

008953414-01, P = 2.665883 Days, E = 128.939551 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.0	2.64	2.33	1.23	4.62	1.77	1.05	14.7	15.8	0.31	1.41	2.69	1.08	0.15	1.34



### Stellar Parameters For KIC 008953414

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4965^{+176}_{-176}$	$4.536^{+0.078}_{-0.054}$	$-0.060^{+0.300}_{-0.300}$	$0.771^{+0.071}_{-0.079}$	$0.744^{+0.095}_{-0.055}$	$2.289^{+0.735}_{-0.388}$
	+4%/-4%	+2%/-1%	+500%/-500%	+9%/-10%	+13%/-7%	+32%/-17%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008953414-01 / KOI 4332.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-21 \pm 8$	$1.20^{+0.26}_{-0.31}$	$1451^{+64}_{-61}$	$3311^{+324}_{-340}$	$9.440^{+8.324}_{-4.475}$
Alt.	$-21 \pm 8$	$1.06^{+0.30}_{-0.28}$	$1447^{+68}_{-58}$	$3418^{+465}_{-366}$	$12^{+13}_{-6}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

## DV Centroid Data

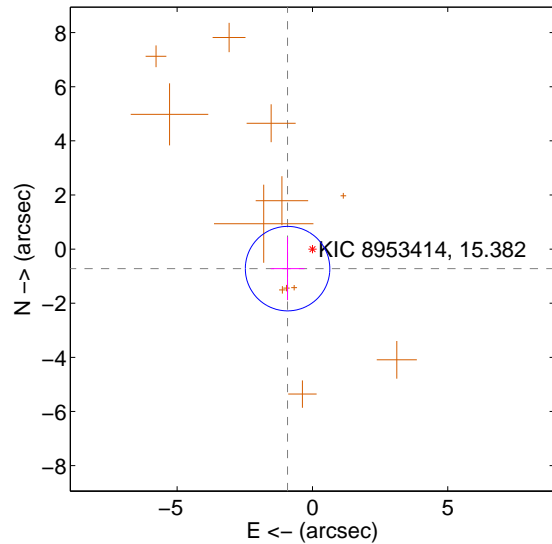
Supplemental centroid analysis for 008953414-01. Kepler magnitude: 15.38. Transit SNR 14.03

There are 0 quarters with good PRF difference image offsets

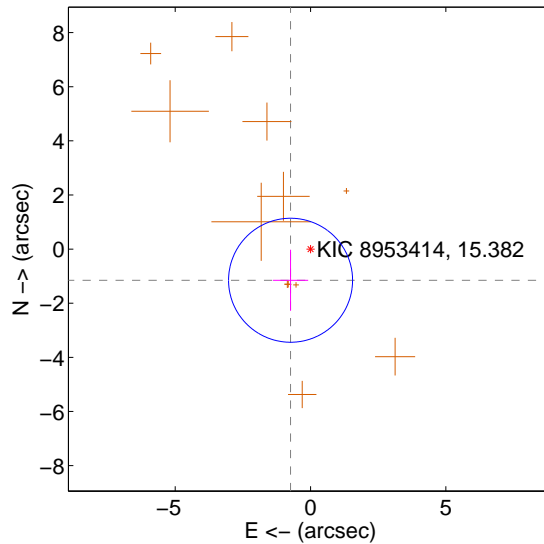
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.168 \pm 0.520$	2.25	$0.919 \pm 0.624$	$-0.722 \pm 1.164$
PRF-fit source offset from KIC position	$1.367 \pm 0.764$	1.79	$0.738 \pm 0.650$	$-1.151 \pm 1.126$
photometric centroid source offset	$4.45 \pm 1.00$	4.46	$2.25 \pm 0.94$	$-3.84 \pm 1.02$

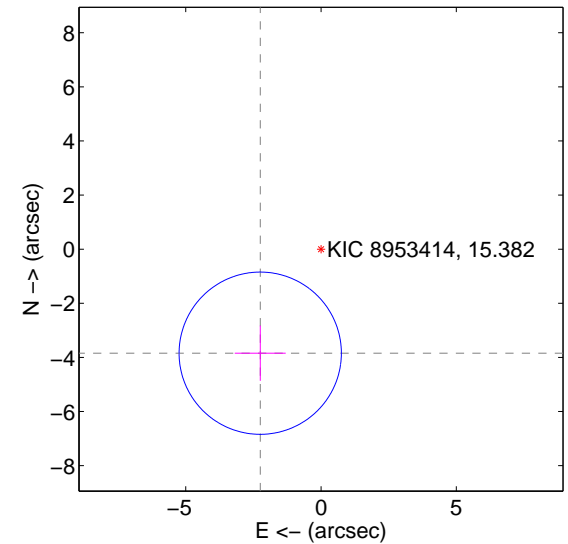
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

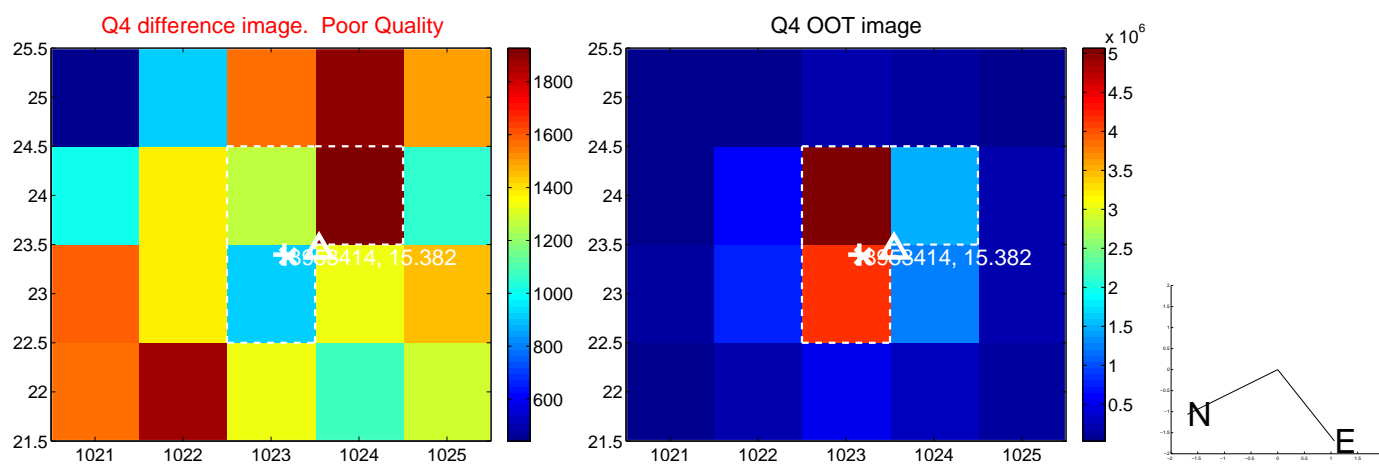
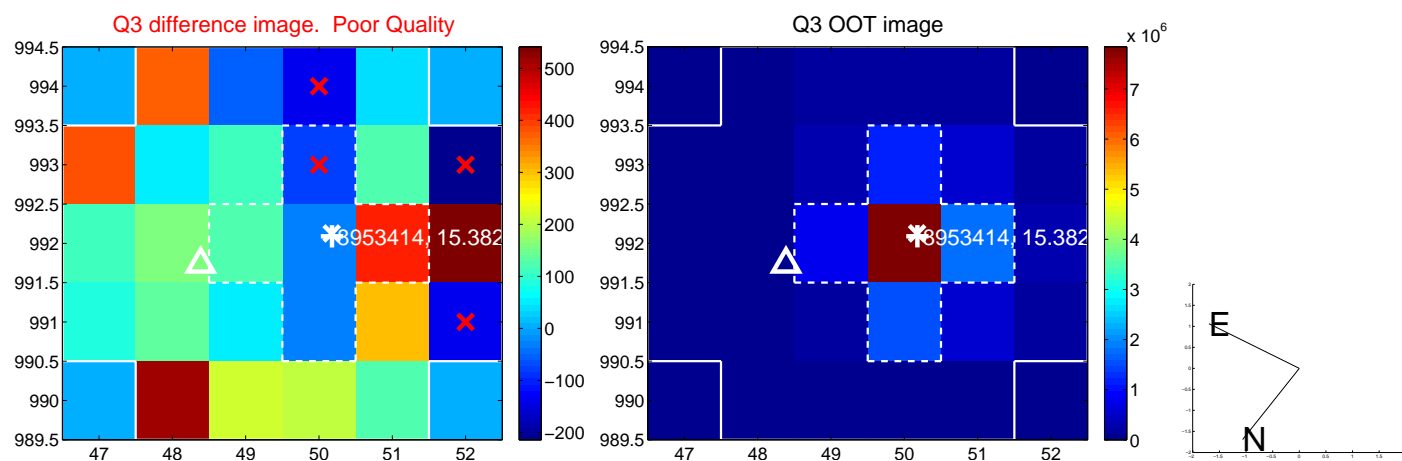
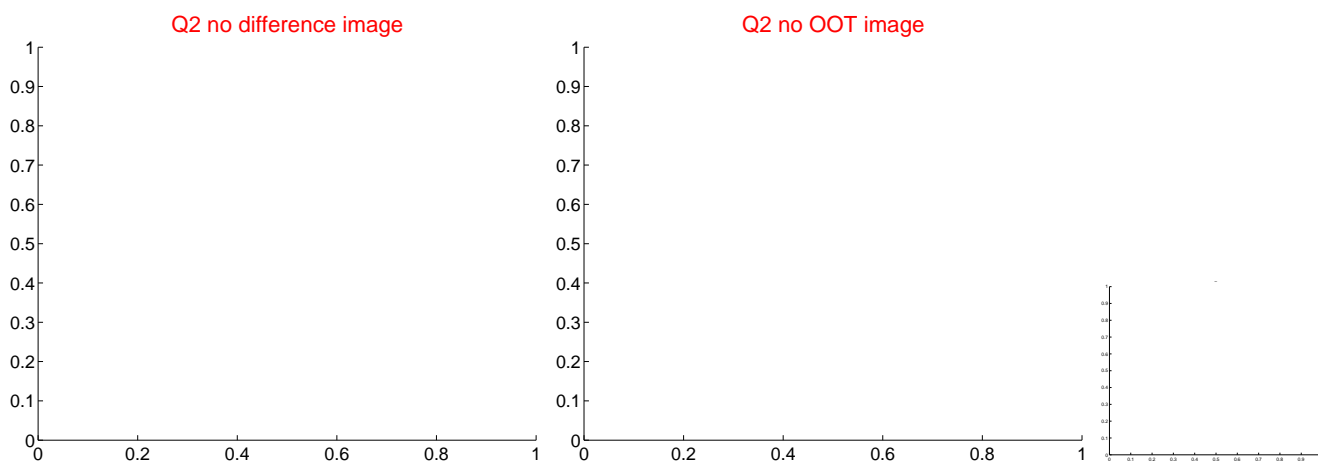
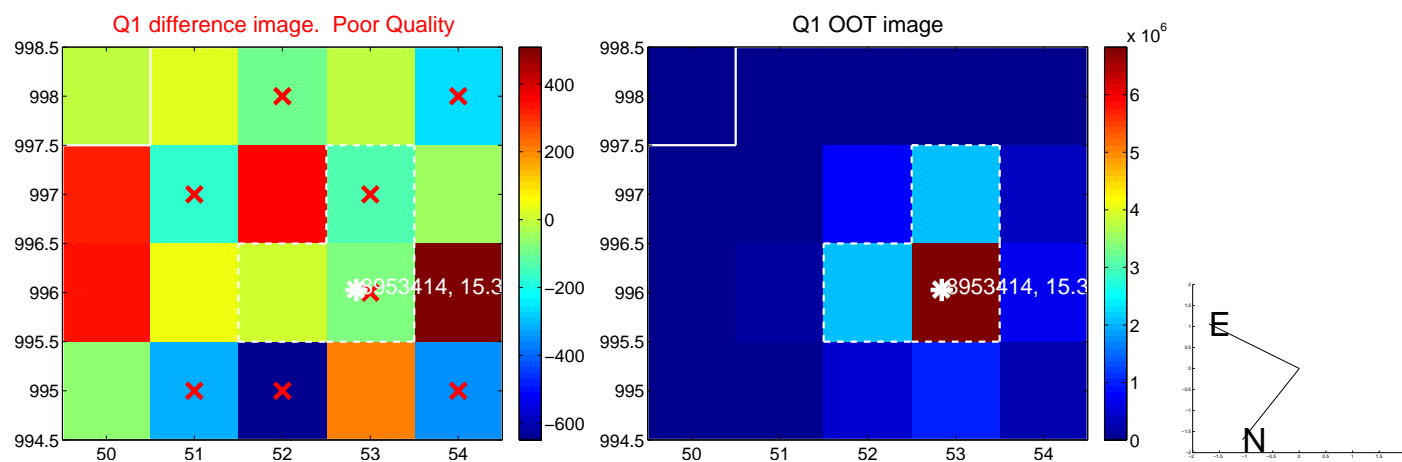


offset from photometric centroids

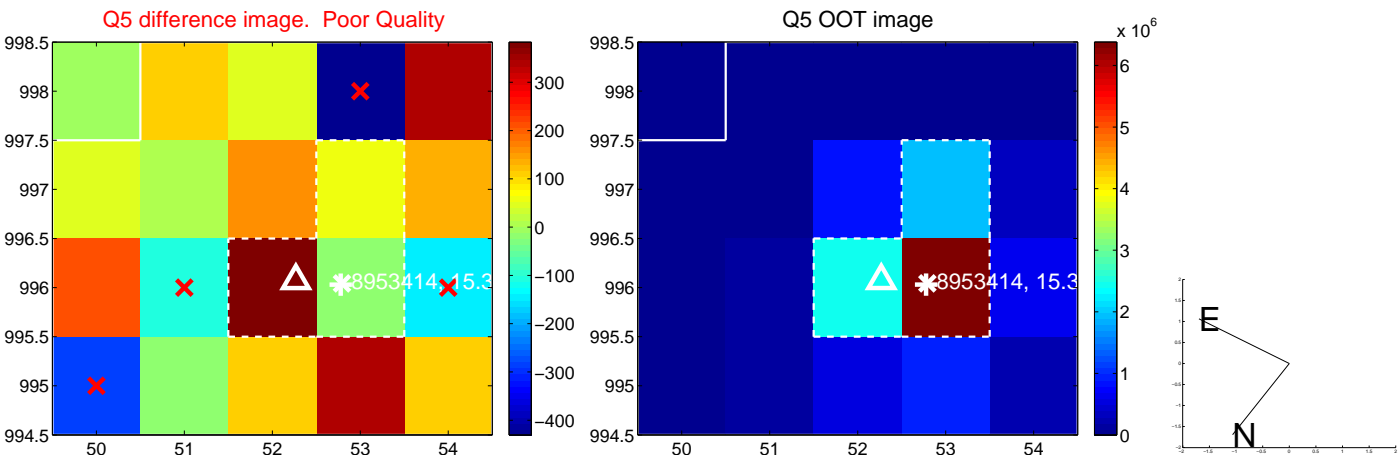


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

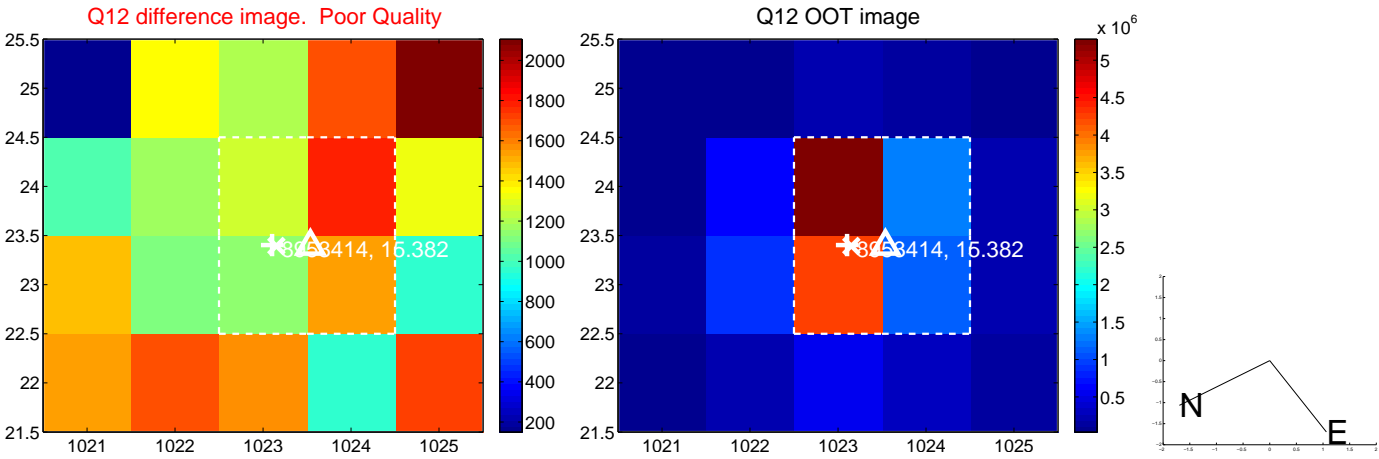
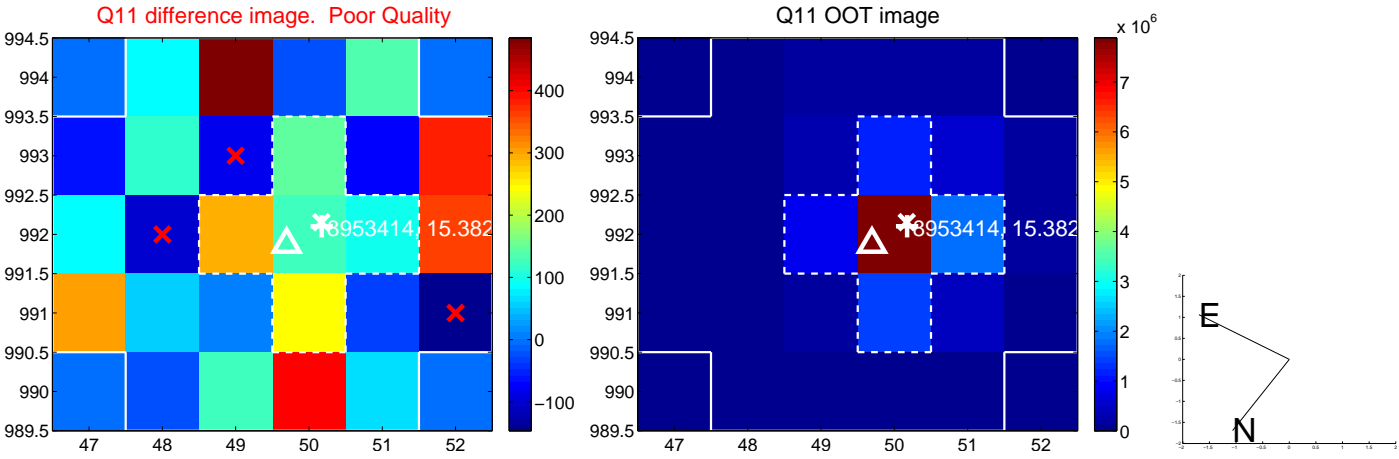
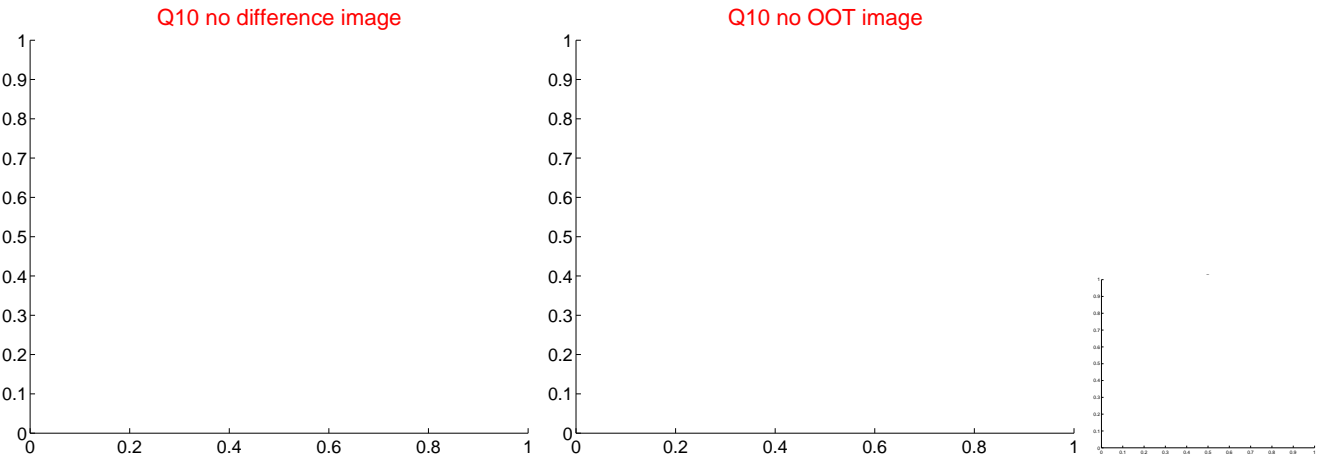
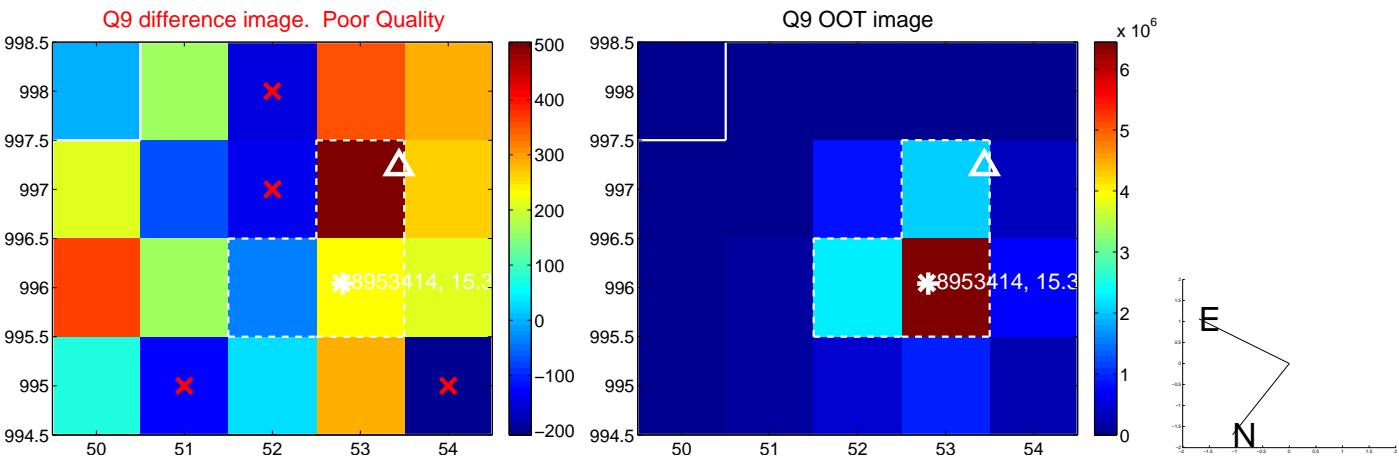
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



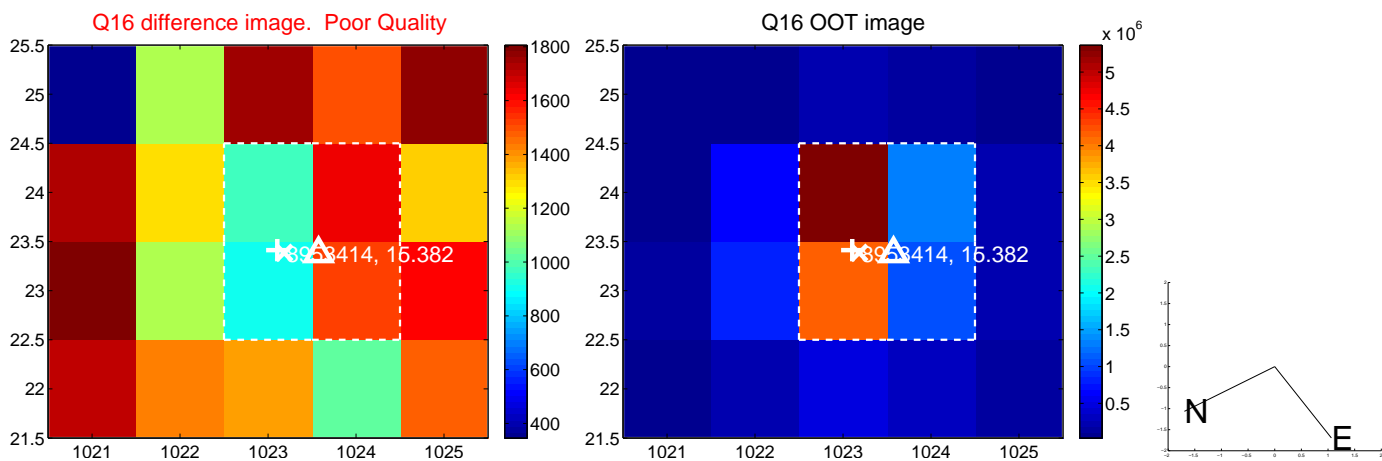
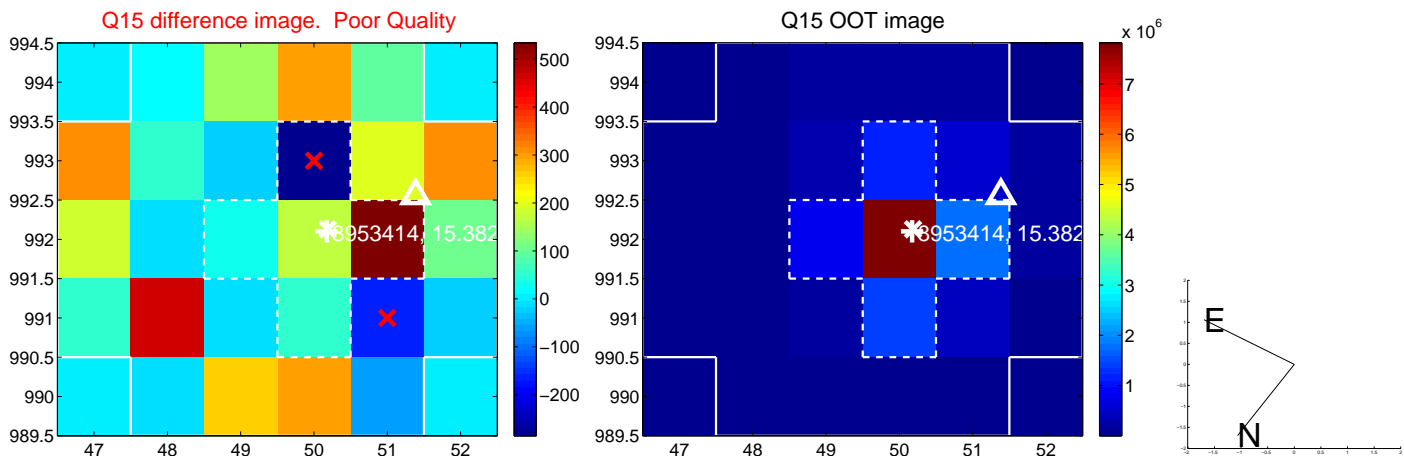
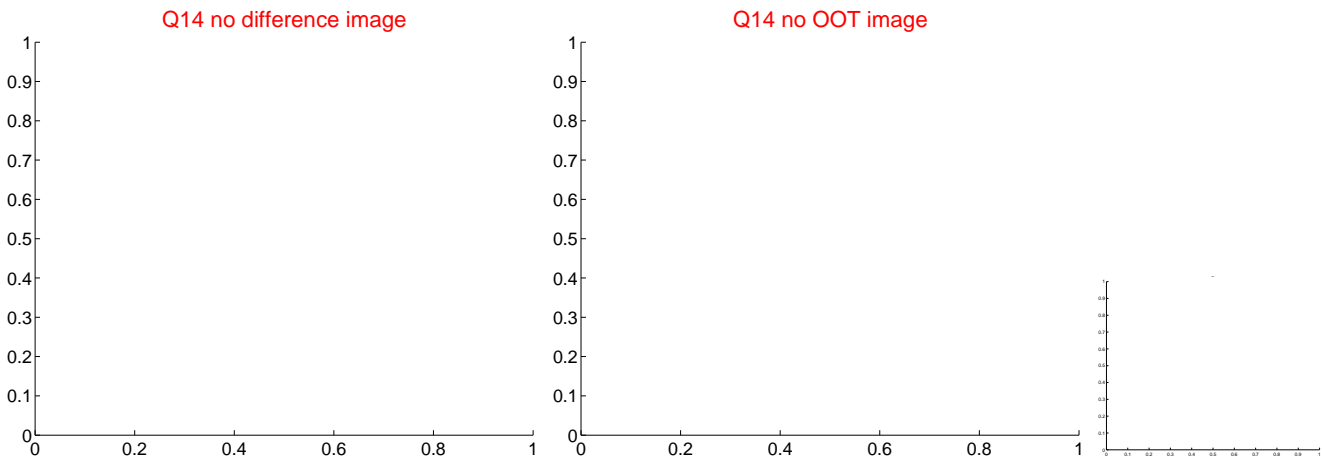
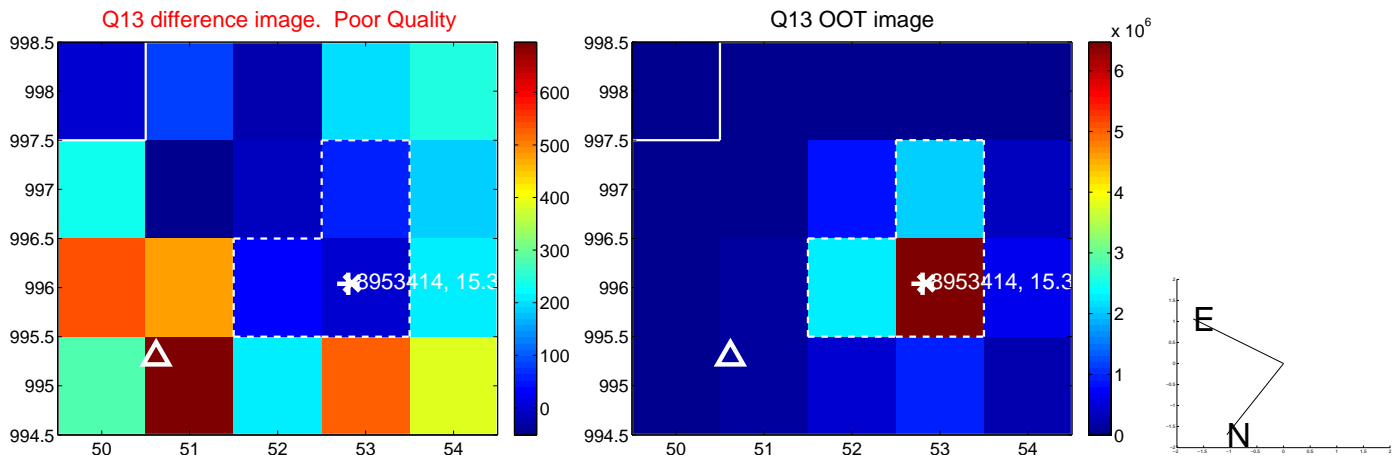
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



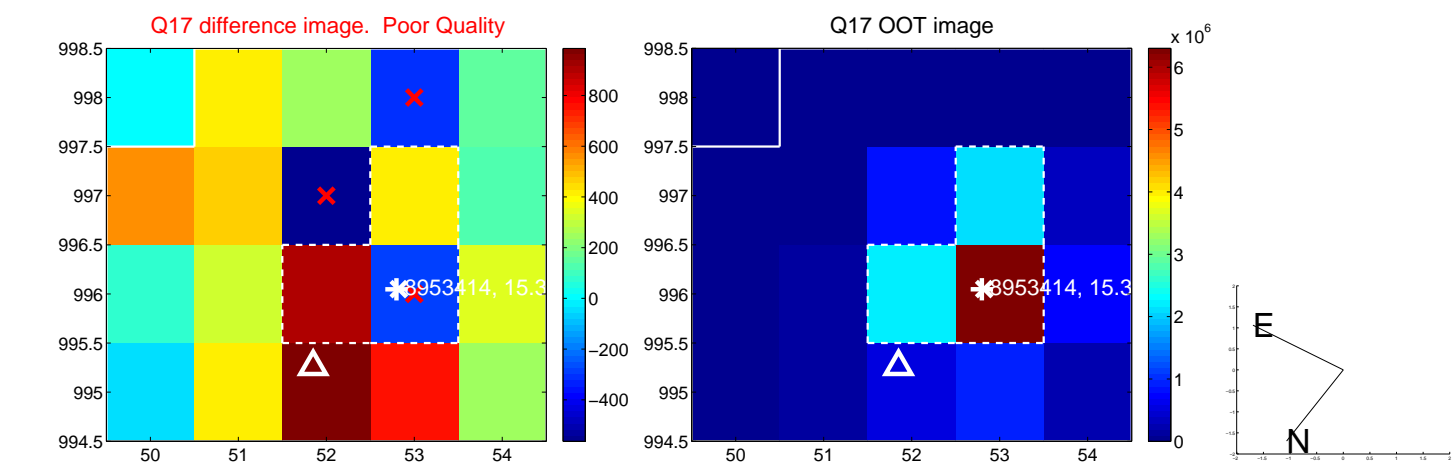
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



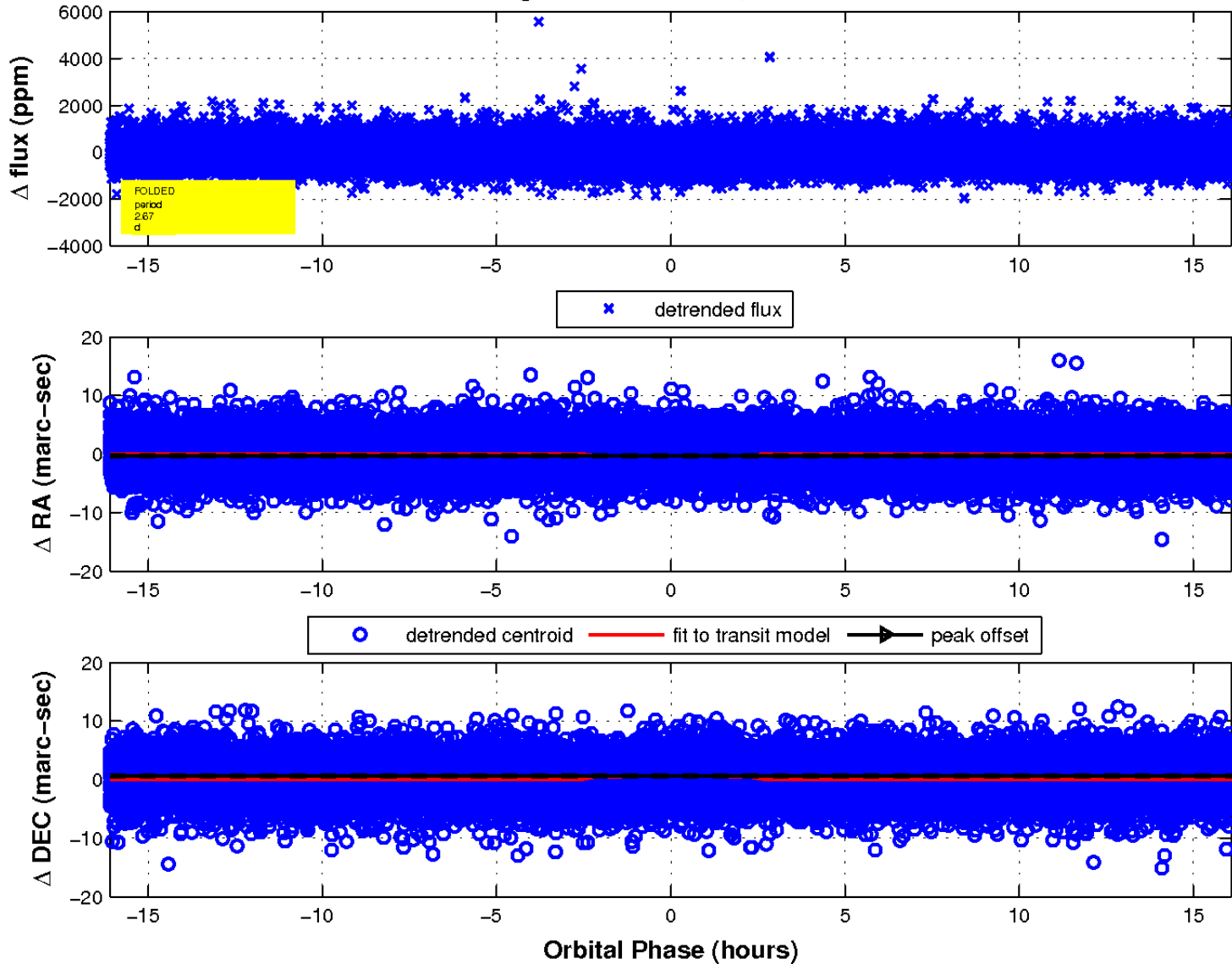
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

